

CLAIMS

1. (PREVIOUSLY PRESENTED) A semiconductor device comprising:
 - a semiconductor substrate;
 - a high-dielectric-constant film on the semiconductor substrate, wherein the high-dielectric constant film is composed of Al₂O₃ having a thickness of approximately 2.5 nm;
 - a nitride layer on the high-dielectric-constant film, the nitride layer formed by introducing nitrogen into a top surface portion of the high-dielectric-constant film and the nitride layer has a thickness of 0.2 to 0.3 nm, wherein introducing nitrogen into the top surface portion comprises introducing nitrogen gas at 300-400 sccm, for approximately 20-60 seconds, at approximately 10-100 mTorr;
 - a gate electrode comprising a p-type impurity layer on the nitride layer, wherein the p-type impurity layer is a boron-contained silicon layer; and
 - a lightly doped drain structure formed by a first introduction of boron to the substrate, a formation of a sidewall spacer adjacent to the gate electrode, and a second introduction of boron to the substrate to form source and drain regions
2. (CANCELED).
3. (CANCELED).
4. (PREVIOUSLY PRESENTED) The semiconductor device according to claim 1, wherein the semiconductor substrate is a silicon substrate or a silicon layer.
5. (CANCELED).
6. (CANCELED).
7. (CANCELED).
8. (CANCELED).
9. (CANCELED).
10. (CANCELED).
11. (CANCELED).
12. (CANCELED).

13. (PREVIOUSLY PRESENTED) A semiconductor device comprising:
 - a semiconductor substrate;
 - a gate insulating film on the semiconductor substrate; and
 - a gate electrode formed on the gate insulating film and including at least a p-type impurity-contained layer, wherein the p-type impurity layer is a boron-contained silicon layer;
wherein the gate insulating film includes a high-dielectric-constant film and a nitride layer on the high-dielectric-constant film, wherein the high-dielectric constant film is composed of Al₂O₃ having a thickness of approximately 2.5 nm, and the nitride layer is formed by introducing nitrogen into a top surface portion of the high-dielectric-constant film to have a thickness of 0.2 to 0.3 nm, and wherein introducing nitrogen into the top surface portion comprises introducing nitrogen gas at 300-400 sccm, for approximately 20-60 seconds, at approximately 10-100 mTorr; and
 - a lightly doped drain structure formed by a first introduction of boron to the substrate, a formation of a sidewall spacer adjacent to the gate electrode, and a second introduction of boron to the substrate to form source and drain regions.

14. (CANCELED).
15. (PREVIOUSLY PRESENTED) The semiconductor device according to claim 13, wherein the semiconductor substrate is a silicon substrate or a silicon layer.
16. (CANCELED).
17. (CANCELED).
18. (CANCELED).
19. (CANCELED).
20. (CANCELED).
21. (CANCELED).
22. (CANCELED).